S
333.7110285
N11MNR
1989

Montana State Library
3 0864 1003 1276 1

THE MONTANA NATURAL RESOURCE INFORMATION

SUBJECT AND GEOGRAPHIC INDEX

(MNRI)

GUIDELINES

FOR USE OF THE INDEX

STATE DOCUMENTS COLLECTI
SEP 2 / 2004
MONTANA STATE LIBR
1515 E. 6th AVE
HELENA, MONTA

Version 2.0

June, 1989 SECOND DRAFT

Montana Natural Resource Information System
Montana State Library
1515 East Sixth Avenue
Helena, Montana 59620

S
333.7110285
N11MNR
1989

Montana State Library
3 0864 1003 1276 1

THE MONTANA NATURAL RESOURCE INFORMATION

SUBJECT AND GEOGRAPHIC INDEX

(MNRI)

GUIDELINES

FOR USE OF THE INDEX

STATE DOCUMENTS COLLECTION
SEP 2 / 2004
MONTANA STATE LIBRARY
1515 E. 6th AVE
HELENA, MONTANA

Version 2.0

June, 1989 SECOND DRAFT

Montana Natural Resource Information System
Montana State Library
1515 East Sixth Avenue
Helena, Montana 59620

TABLE OF CONTENTS

Chapter 1	Introduction
Chapter 2	Standards for Indexing Records
Chapter 3	Edit, Append the Index
Chapter 4	Searching the Index

TABLES

1	List of fields recommended for complete entry
2	Additional fields of information for environmental statements
3	Additional fields of information for automated data files

FIGURES

1	Montana map with Latitude - Longitude
2	Blocks of Counties
3	DFWP Districts
4	Drainage Basins
5	Latitude - Longitude template
6	Welcome Screen
7	Types of Information Screen
8	Master Menu Screen
9	Edit Screen
10	Entry Screen (initials and date)
11	First Entry Screen
12	Second Entry Screen
13	Abstract Entry Screen
14	Another Record Screen
15	Search By Screen
16	Output Choice Menu
17	Direct Output to Screen
18	Keyword Search Screens
19	County Search Screen
20	Latitude, Longitude Search Screen
21	Latitude, Longitude Search Limits
22	Author Search Screen
23	Author and Date Search Screen
24	Subject Codes
25	Ad Hoc Query Screen
26	Latitude, Longitude Map Example

APPENDICES

A — Index Examples:

B — Subject Codes
- Part 1 Hierarchical
- Part 2 Alphabetical

C — WLN Name Authority List
WLN Library Abbreviations
Statute Codes (for EIS's)

D — Intro to Geographics
- Short explanation of Latitude/Longitude
- Quickie Guide to Township and Range
- List of Commonly Encountered Least Rectangles
- Map Scale Computation (Unitless Ratio)

E — dBase III+ File Structure
Blank Entry Form

F — Standards for Entering Supplemental Descriptive Information for Special Types of Records.

CHAPTER TWO

STANDARDS FOR INDEXING INFORMATION FOR NEW RECORDS

The previous chapter emphasized the importance of standardization in ensuring data format compatibility with other users and the ability to share information among users. This chapter describes the standards for ensuring that compatibility.

For convenience, the term 'document' will be used in these Guidelines when referring to all types of items (e.g. published and unpublished books, maps, aerial photographs, satellite imagery, expert person...). Certain pieces of information are used to index each document included on Montana Natural Resource Index. In computer data base terminology each of these pieces of information is called a field. All the fields describing a particular document together comprise a record. Generally, except for Collection type documents, there will be one record for each document. This chapter covers the descriptive fields that should be entered for each record.

Table 1 lists the fields recommended for entry. A description of each of these fields follows in the order found in the Montana Natural Resources Index.

FIELD ENTRY STANDARDS

GENERAL

Use capital letters only for the first letter of a title, names, and proper nouns. DO NOT use all upper-case letters for any field unless otherwise instructed.

Entries should conform to the *Fifth Edition of the Council for Biology Editors Style Manual* (for biological topics) or the *Chicago Manual of Style* (for other topics) or as specified.

1. CODE

elim all periods on # characters

(6 characters.) ~~New~~ Records appended to the Natural Resource Information System (NRIS) will be assigned unique numbers. For duplicate copies of documents only one NRIS code number should be assigned, (the "SHELFNOTE" field should reflect the locations of all copies).

The NRIS code number should be written in pencil in the upper right hand corner of the documents' title page, prefixed by "NRIS". If the title page is the first page in the document then write the NRIS number in the upper right hand corner of the page following the first page. There should be no duplication of code numbers, except on duplicate copies of the same publication.

2. AUTHOR

(~~200~~ 100 characters.) This field contains the name(s) of the author(s), (or editors, coordinators, compilers) if known, or the sponsoring agency if there is no personal author. Always place a period at the end of the entry. Do not space between initials, but be sure to put one space between names and the word "and". Some examples are included here, Appendix A has further examples.

Examples: Jones, J.K. (personal sole author)
U.S. Forest Service. (sponsoring agency as author)
Knox, F.V., and E.F. Jones. (multiple authors)

TABLE 1

RECOMMENDED FIELDS OF INFORMATION FOR A COMPLETE MNRI[1] RECORD

Field Contents	Field Length (characters)	dBase III+ Field Name
NRIS Code	6	CODE
Author	100	AUTHOR
Month and Day(if available)	20	MONTHDAY
Year	4	DATE
Title	254	TITLE
Citation	254	CITE
Author's Affiliation(if appropriate)	65	AUTH_AFFIL
Keywords	254	KEYWORDS
Subjects	254	SUBJECTS
Subject Codes	27	SUBCODE1
	27	SUBCODE2
	27	SUBCODE3
	27	SUBCODE4
Type of Source	3	TYPE
Shelfnote	35	SHELFNOTE
States	23	STATES
Counties	75	COUNTIES
Fish, Wildlife & Parks Regions	6	DFWPDIS
Drainage Basins	35	BASIN
Latitude and Longitude	4	S_LAT
	4	N_LAT
	5	E_LON
	5	W_LON
Coverage Dates	13	COVDATE

1 Montana Natural Resource Index

If you want to search for studies with two authors from a particular year then type in Y and press enter when asked if you want another author. Otherwise type in N.

[F] Water Codes - not available.

[G] Subject Codes [figure 24] - allows entry of up to two subject codes for searching. Use only the subject codes from the lists in Appendix B. All documents with that particular subject code will be retrieved.

Type in the subject code and press enter. If you want to enter a second subject code answer Y to the prompt and press enter. Type in the second subject code, following the prompts.

[H] A Combination of Anything of any Two of the Above - not available, use the ADHOC query instead.

[I] Construct an AdHoc Query - this selection provides the most flexibility in setting up search criteria. Use dBase III+ logical operators to create search strings. The screen [figure 24] contains an example. A few notes may help.

AND - if two criteria are joined by an AND, then the computer will search for everything with both criteria contained in it.

OR - if two criteria are joined by an OR, then the computer will search for everything with either criteria in it.

The '$' preceding the field name, such as $COUNTIES, means contained in. The entire field indicated will be searched for that particular group of characters.

UPPER as in UPPER(field name) is another option. It is used in the example on the screen as 'TURBIDITY' $UPPER(TITLE). This will check the title field for the term 'TURBIDITY'. It will ignore whether the word in the title is, or is not, capitalized.
For example:

Searching for 'TURBIDITY' $UPPER(TITLE) will retrieve both of the following titles:

'Turbidity in the Missouri River.'
'The role of turbidity in water quality.'

Example of the use of AND and OR:

If you want everything only in Lewis and Clark County on only Water then you would use AND:

'LEWI' $COUNTIES .AND. 'WAT' $SUBCODE1

If you want everything on Lewis and Clark County and everything on Water then you would use OR:

'LEWI' $COUNTIES .OR. 'WAT' $SUBCODE1

'COUNTIES' and 'SUBCODE1' are field names. There is a list of field names in Appendix B for the index.

It may take some time to become comfortable with building Ad Hoc search conditions, but it is a very powerful tool.

It may take some 'trial and error' use to learn which search will be the most efficient. As you gain familiarity with the index, it will become easier to design search criteria to retrieve exactly the documents you want.

[Q] Quit - returns you to the Master Menu.

SEARCHING

The 'Search By' menu is shown in figure 15. The following options are available:

[A] Keywords - see figure 18 for Keyword search screens. A keyword may be composed of one or several words. Each word or group of related words is considered a single keyword. Examples of valid keywords are: Clark Fork River, cutthroat trout, grizzly bear, Silver Bow Creek, Milltown Dam, and salmo gairdneri. This option will search for the keywords in the following fields: TITLE, AUTHOR, CITATION, and KEYWORDS.

The first screen gives you a choice of searching:

[A] All sources except abstracts

[Q] Quit

Unless you made a mistake and you didn't mean to search by Keywords type A and press Enter.

The next prompt will appear-

'Enter a character string:'

Type in a keyword and press enter. Quotation marks are not needed around the keyword.

The next prompt will appear:

'Do you wish to search for another character string? Y/N'

If you have only one keyword then type 'N' and press Enter. Otherwise type 'Y' and press Enter; a prompt will appear for the next keyword and press Enter. The computer will automatically bring up the 'Output Choice' menu.

Keywords should be typed in exactly as they would appear in a document. If normally separated by a dash in print, then type them in separated by a dash. You will need to properly capitalize any letters normally capitalized, if in doubt use the ADHOC Search option. The program will search for the keywords exactly as they have been typed in.

If you type in two keywords the computer will search for all sources with both keywords contained in the keywords, and only those sources with.<u>both</u> keywords will be retrieved. For example if you enter both Clark Fork and Silver Bow Creek, then only sources containing both Clark Fork and Silver Bow Creek will be retrieved. If you want everything on the Clark Fork as well as everything on Silver Bow Creek, then you must either do two single keyword searches or use the Ad Hoc option.

[B] County - Searches the county field for one, or two counties. The county search screen is shown in figure 19.
The following prompt will appear:

'Type in the first four letters of the county name:'

Type in the first four characters of the county name and press enter. If you want to search for records with more than one particular county in them, answer Y to:

'Do you with to search for another county?'

You will be prompted to enter the second county. If you do enter two counties only records with both of the counties in the COUNTIES field will be retrieved.

In general this search option, by County, is only used if you desire retrieval of everything which has that county in its area of coverage.

[C] Latitude and Longitude - This option allows you to search by a geographical area. It will retrieve anything which falls in the lat/long square of the study area. The search screen [figure 20] prompts you to type in each: north latitude, south latitude, east longitude, and west longitude. The program will alert you if you make a mistake and accidently switch north with south or east with west.

A second screen will appear [figure 21]. This allows you to limit the information retrieved. The options are:

[A] No Limits - will return everything.

[B] All but Statewide Studies - retrieves everything except for statewide studies.

[C] Only Studies That are Smaller than 3 Degrees x 3 Degrees - retrieves everything which falls in the area described by your lat/long, plus only other studies which are no larger than 3 more degrees on a side than your lat/long.

[D] Only Studies That are Smaller than 2 Degrees x 2 Degrees - retrieves everything which falls in the area described by your lat/long, plus only other studies which are no larger than 2 more degrees on a side than your lat/long.

[E] Only Studies That are Smaller than 1 Degree x 1 Degree - retrieves everything which falls in the area described by your lat/long, plus only other studies which are no larger than 1 more degree on a side than your lat/long.

Option D is the most commonly used selection.

[T] Township and Range - not available, you must manually convert to Latitude/Longitude.

[D] Author [figure 22] - searches by last name of Author only. You may enter up to two last names.

Type in the last name of the author, press enter. If you wish to find only those sources which have two particular authors then answer Y to:

'Do you wish to search for another author? Y/N'

Follow the prompts to type in the last name of the second author.

If you do type in names of two authors using this option, studies with 'et al' will not be retrieved.

[E] Author and Date [figure 23] - allows you to type in the last names of up to two authors and one year for searches. This will retrieve only studies having both the author and the date requested. In the case of two authors, it will retrieve only studies with both authors and the date requested. Type in the last name of the author, press enter. Type in the year you are interested in, press enter.

OTHER MENU OPTIONS:

[C] Append Multiple. This option is not available.

[D] Query/Report. Described in Chapter 4.

[Q] Quit (return to dot prompt). Returns control to dBase, to restart MNRI type DO NRIS, to get back to DOS type QUIT.

NEW ENTRIES-PRINTING, EDITING

Step 1: Get into dBase go to dot prompt
Step 2: Type 'Set default to A:', press Enter
Step 3: Type 'DO NRIS', press Enter
Step 4: Press Enter until you reach the Master Menu
Step 5: Choose option 'D' Query/Report
Step 6: Choose option 'J' No Search Conditions--Select All Records on menu, press enter
Step 7: Choose option 'F' Full Dump on Output choice menu, press enter
Step 8: Turn on printer, choose option 'B' The Printer on Direct Output to menu, press enter.

This gives a "dump" of all entries on the disk, one record per sheet of paper. These can be compared with the original entry forms for accuracy.

One quick way to edit these, if necessary:
Step 1: Get into dBase, go to dot prompt, type in 'Set default to A:', press enter.
Step 2: Type 'Set Status On', press enter
Step 3: Type 'USE MASTER INDEX MASTCODE, MASTTITL, MASTNAME', press enter.
Step 4: Type 'SEEK ######', press enter, where ###### should be replaced with the NRIS Code Number of the record to be edited.
Step 5: Type 'EDIT', press Enter, edit the record. Use ^End (Ctrl + END) to save any changes and exit the record.

Repeat Steps 4 and 5 until all the changes have been made.

Step 6: To quit, type 'QUIT', press enter

To append the new, proofread, entries to the master index:

Step 1: Get into dBase go to dot prompt.
Step 2: Type 'USE MASTER', press enter, (you should be in the drive of the Master copy of the index).
Step 3: Make sure the diskette with your "new" entries is in drive A.
type 'APPEND FROM A:MASTER", press enter and wait, this may take a while.
Step 4: Type 'SET INDEX TO MASTTITL, MASTCODE, MASTNAME', press enter
type 'REINDEX', press enter and wait, this will take a while (sometimes longer than 15 minutes).

Make certain NRIS receives a copy of the new entries, on disk.

CHAPTER 4

SEARCHING THE INDEX

The MNRI (Montana Natural Resource Index) allows for many different kinds of searches. Searches may be made on Keywords, Counties, Author, Subject Codes, or by geographical areas by latitude and longitude or any combination of these. Some queries have already been programmed and all you have to do is supply the prompted information.

To do a search, or query, select 'D', QUERY/REPORT, from the Master Menu. The 'Search By' screen will appear [figure 15]. The selections will be explained later. Since all search options end with bringing up the 'Output Choice Menu [figure 16], and the 'Direct Output to' screen [figure 17], these will be discussed first.

FORMAT AND PRINT OPTIONS

OUTPUT CHOICE MENU [Figure 16]

This allows you to choose how much information from a record is to be Output and in what format.

[A] Full Citation - includes Author, Title, Citation, Date fields; does not give location of source.

[B] Full Citation with Location - same as in option A, but also includes the shelfnote field.

[C] Full Citation with Location plus Dummy Characters - same information as in option B, but with "dummy" characters inserted for use in a word processor. This is the 'usual' option for reports.

[D] Full Citation with Location and Abstract - includes everything in option B plus the Abstract. Since most entries do not have abstracts, this option is rarely used.

[E] Full Citation with Location and Abstract plus Dummy Characters - includes everything in option D, but with the "dummy" characters for word processing. This option is also rarely used for the same reasons as for D.

[F] Full Dump of Entire Record Contents - used mainly for proofreading of entries. Prints one entry per page.

[Q] Quit - returns you to Master Menu.

After you have selected the format of the output then you have to tell the computer where to send the output. Figure 17 shows what the 'Direct the Output to' screen looks like. The options are:

[A] The Screen - the sources retrieved from the index will appear on the screen. You can use the 'PAUSE' key to prevent scrolling of the retrieved documents on the screen.

[B] The Printer - the documents retrieved from the index will be sent directly to the printer. Make sure your printer is on when you make this selection. The retrieved documents will also appear on the screen.

[C] A Word Processing Document - the documents retrieved are sent to a word processing file, named by you. This file may then be edited using a word processor to create a professional looking report.

Type in your initials and press Enter. (The computer will automatically capitalize them.) Check the date. If it is correct press Enter, if it is not correct type in the correct date then press Enter.

THE FIRST ENTRY SCREEN

The first Entry Screen will appear.[Figures 11] This is the first of two entry screens. The field size showing on the screen is the maximum size of data which can be typed in using the entry screen program. (The fields in the entry screen are not in the same order as listed in Chapter 2.)

Press Enter to get into the screen.

NOTE: The Enter key will take you forward through the fields on the screen, you cannot back up to a previous field. To correct an entry in a previous field will be covered below. Use the cursor keys to move around within a field.

CODE NUMBER: Type in the NRIS Code Number assigned to this document, press enter. Ignore the '9' already in the field, it will disappear when you press Enter.

YEAR OF PUBLICATION: Type in the year of publication. You do not need to press Enter, the Month and Day field will pop up as soon as the year field is filled. Press Enter if there is no Month and Day otherwise type in the Month and Day and press Enter.

TYPE OF SOURCE: Type in the document type, a pop-up window serves as a reminder of the valid types, you don't have to press return.

AUTHOR: Type in the author. Press enter to get to the next field. The first line and part of the second after the fieldname AUTHOR are the AUTHOR field. There must be an entry in this field.

AUTHOR AFFILIATION: Press enter if none; otherwise type in the AUTHOR AFFILIATION and press enter. This field is the single line below the heading AUTHOR AFFILIATION, (the line to the left of this heading is part of the AUTHOR field).

TITLE: Type in the title, press enter until in the next field.

CITATION: Type in the citation, press enter until in the next field.

SHELFNOTE: Type in the shelfnote(s), press enter.

The cursor will go to the top of the screen and the message will appear:

'Does this entry look okay? Y/N'

Type 'Y' if there are no changes needed, the second entry screen will then come up. Type 'N' if an entry in a field is not correct. The cursor will drop down to the Code Number field and you may edit the entries.

THE SECOND ENTRY FIELD

The cursor will go to the top of the second entry screen [Figures 12] and the following message will appear:

'Enter 0 to exit, return to continue..' (A to abort)'

0- Leaves you in the entry program, but erases everything done in screen 1.
return- Positions the cursor in the first field of screen 2.
A- Abort: leave the input program, nothing is saved from screen 1.

Press Enter to get into Screen 2.

KEYWORDS, SUBJECTS: Type in the keywords. Do not capitalize the first letter of the first keyword in the field unless it should normally be capitalized. If there are more keywords than will fit in this field they can be continued in the SUBJECT field. Never split a keyword between the two fields. End each field which contains entries with a period.

SUBJECT CODES: (4 fields) Type in the subject codes. Separate the codes in a field with periods. Press enter to move to the next field.

COVERAGE DATES: Type in the coverage dates as MM/YY-MM/YY.

STATES: Type in the two letter code for each state, separate with periods, press enter. If there is not enough room for all the states, Montana and the adjacent states and provinces take priority.

COUNTIES: Enter the county or county block codes, separate by periods, press enter. The county field is split between two lines.

DFWP DISTRICT: Type in the district numbers, press enter. Do not separate by periods or spaces.

RIVER BASINS: Type in the River Basin Codes, separate by periods, press enter. This field is shorter than described in Chapter 2.

LATITUDE/LONGITUDE: Type in the latitude/longitude in the appropriate field. NOTE: the first field to be entered is North, not South. You do not need to press enter after each field.

The cursor will go to the top of the screen and display the message:
'Does this entry look okay? Y/N'

N- Allows you to go back and edit entries
Y- Brings up the next screen

The next screen is the Abstract Entry Screen [figure 13]. Type 0, bypass this screen, abstracts are not currently entered.

The next screen is [figure 14]:

'Do you want to enter another record Y/N'

Y- Brings up the first entry screen
N- Returns you to the Master Menu

CHAPTER THREE

USING THE INDEX

Computer Requirements.

Currently the data base index is written for use with dBase III+; a copy of dBase III+ is required to utilize the index. One option in the index is to send reports from searches to a word processing document. This will allow for editing of citations before release. A copy of a word processor will be necessary in order to do this.

A compiled version of the index is being written. The index will then be independent of any data base.

The minimum suggested hardware is: an AT type IBM compatible computer, a hard drive, a floppy drive, and a printer. The index will operate on an XT-type computer with a hard drive but search time may be prohibitively slow.

Getting into MNRI.

Step 1. First bring up dBase III+, and go to the dot prompt. (If you are not familiar with dBase III+, consult the manuals which came with dBase III+.)

Step 2. a) If the index is installed on a hard drive --
Type "DO NRIS", press ENTER
b) If the index is installed on a floppy drive--
Type "SET DEFAULT TO A:", press ENTER
the type "DO NRIS", press ENTER

Step 3. Press enter to bypass the normal dBase III+ license agreement screen

Step 4. NRIS Welcome Screen--[figure 6] Press any key to continue.

Step 5. Types of Information Sources Included Screen--[figure 7]
Press any key to bypass this screen

Step 6. Master Menu--[figure 8] This menu has five choices:

[A] Edit.
Allows the editing of records in the data base provided the record number is known. This option also will take you to the TOP or BOTTOM of the data base, automatically open a record in Edit mode.

[B] Append Single Records.
This option brings up entry screens for entry of new records and then adds the new entries to the index.

[C] Append Multiple Records.
This option not available.

[D] Query/Report.
This option takes you to the search menus. Chapter 4 covers searching.

[Q] Quit.

Option to leave NRIS, returns you to dBase III+.

To choose an option you type in the letter ('A','B','C','D', or 'Q') of your choice. Each option is described in more detail below.

To exit from the index:
Select Q from the Main Menu, then type 'QUIT' and press RETURN, at the dot prompt.

THE SELECTIONS

[A] EDIT.

Select 'A' at the Main Menu. The screen which appears is shown in figure 9. The edit sub-program requires either the record number of the desired record (which is not the same as the NRIS code number), TOP, or BOTTOM.

Type in your choice and press enter.

- TOP goes to the top of the database and brings up the first record in edit mode.
- BOTTOM goes to the bottom of the database and brings up the last record in edit mode.
- Typing in a record number brings up that record in edit mode, if that record number is in the data base. (If the record is not in the data base the computer will bring up the last record in the data base and display it.)

Each record has four screens of fields of data. To edit the entries use normal dBase commands. If any permanent changes are to be made to the entries, use Ctrl + End (^END) to save the changes into the data base. The program will automatically return you to the Master Menu after leaving the record.

[B] APPEND SINGLE RECORDS.

Before adding any new entries the index must be checked for possible duplicate entries, do this using edit or dBase browse.

- If there is already an entry for that particular document in the index, then copy the NRIS Code number into the document and add the location to the shelfnote field.
- If there is not an entry in the index then continue.

Never delete an entry after it has been added. The NRIS staff will handle all deletions. Since the index is used by many groups, if you delete an entry it could cause problems for other users.

The suggested method of adding new entries is to add the records to a separate temporary diskette, (even if you are using the index on the hard drive). The new entries then can be printed, proofread, and edited, as a group before appending them to the main index. Accuracy in entry is essential. Something simple such as a misspelled word may cause a source to not be retrieved.

Step 1: An "entry" diskette with the entry program files on it will be provided to those indexers who wish to index new entries. To use the entry program, get into dBase and go to the dot prompt. At the dot prompt type "Set default to A:", press return, assuming that you are adding to a temporary diskette.

Step 2: Type "DO NRIS", press return.
Step 3: Continue to press ENTER until you get to the Master Menu.
Step 4: Select "B", and the Initial and Date screen will appear [figure 10].

(a) Authors' Names Known. For a sole author, list the last name first followed by a comma and a space and then the first full name, if known, and the middle name or initial. If there are multiple authors: follow the same rules for the first, (or senior author) as for the sole author. For the additional authors, list first and middle names, or initials, before their last name. Use commas between each author.

Examples: Smith, John L.
Smith, George A., and Carl Yung.
Allen, Mark, A.B. Crain, and D.E. Fenton.

If more than three authors' names are listed, you may either list all the authors or include only the first author's name followed by "et al.", do not use a comma before the "et al".

Example: Pfister, Robert E. et al.

If the authors listed are in fact editors, compilers, or coordinators rather than actual authors use "(ed.)" or "(eds.)" following the name(s). A document edited by Edward J. Grand and P.V. Blair would have an author entry of :

Grant, Edward J., and P.V. Blair (eds.).

(b) Authors' Names not Known. If the names of the authors are not known, list the agency and the subagencies sponsoring the work as the author. Use the names as listed in the Western Library Network (WLN) Name Authority File [Appendix C]. Always abbreviate "Dept." for Montana state agencies. Use a comma to separate each subdivision of an agency. Do not split up agency name and sub-units between the AUTHOR and CITATION field. Always list the larger entity first. Most of the time it will not be necessary to list more than the agency name and one subdivision.

Examples: U.S. Forest Service, Lewis and Clark National Forest.
not-
U.S. Dept. of Agriculture, Forest Service...., (per Appendix C).

U.S. Dept. of Energy, Bonneville Power Administration.
not-
Bonneville Power Administration, U.S. Dept. of Energy (larger entity first always)

U.S. Geological Survey, Water Resources Division.
Montana Dept. of Natural Resources and Conservation, Energy Division.
Montana Dept. of Fish, Wildlife, and Parks, Wildlife Division, Special Projects Bureau.
(. Clone Gap
U.S. Bureau of Reclamation, Region 6, Missouri-Souris Project Office.

(c) Non-Written Sources. The AUTHOR field is used to describe the person or entity responsible for documents such as computer files, aerial imagery, maps, and manual data files. If the name or names of individuals responsible for the source are known, then list their names here and include their affiliation, if known, in the AUTHOR'S AFFILIATION field. If the names are not known, then list the agency responsible for the existence of the document in the AUTHOR field. Describe the "address" of the document (where it is housed, address, and phone number of principal contact) in the CITATION field.

(d) Collections. For collections, other than collections of periodicals, the "Author" of the collection is the agency where the collection is housed. For periodicals the Author is the agency or corporation responsible for publishing it.

DATE

Always list the month, day, and year, if the information is available. This information should be obtained from the title page or cover of the document. For periodicals, enter the start date; it will quickly render an entry obsolete if the end date is included.

3. YEAR

(4 characters.) For published documents, list the year of publication. If more than one year is given, or if the source spans a number of years, the copyright date is always preferable to the date of the last printing. If the year of publication or the year of copyright is not known put n.d. in this field.

4. MONTH AND DAY

(20 characters.) List the month of publication of the document if it is known. Spell out the month name. If the day of the month of publication is also known, list it along with the month.

5. TITLE

(254 characters.) For published documents, the title should be taken from the title page rather than from the cover, unless the cover gives a more complete title. Enter the title exactly as it appears on the document. The following rules should be used for titles:

- Subtitles, include after the main title with a comma and a space separating them.
- Abbreviate only if necessary to fit the title into the allotted space.
- Capitalize only the first word of the title, any proper names, and place names.
- Do not enclose title in quotation marks.
- Do not include place of publication in the title field.
- If the title begins with 'A', 'An', or 'The', put a comma and the 'A', 'An' or 'The' at the end of the title.
- End each title entry with a period.

Examples: Montana's forest products industry, a descriptive analysis 1981.
Fishery and aquatic management program in Yellowstone National Park, 1987.
Solar handbook, The.

For maps, aerial photographs, and satellite images, list the scale and base in parenthesis following the title. Always present the scale of a map, aerial photograph, or satellite image as a unitless ratio. This may be given on the map, it will be expressed as 1/63,360 or 1 : 63,360 (1 will be the first number). Appendix D has a section explaining how to express the scale of a map as a unitless ratio, and how to convert to a unitless ratio if not given on the map.

Information about resources which has never been published or is in a non-standard format is a special case. Describe the document as completely as possible within this field. For bibliographies or special collections, list the number of titles included in the bibliography or collection. If the document does not have a title, then describe the format of the document in this field. Be specific when describing the document.

Examples: Field data forms giving water sampling data from Silver Bow Creek.
Computer punch cards with Yellowstone geyser information.

~~Expert person with knowledge of Bald Eagle nest sites.~~
Unpublished tables listing daily streamflow at three stations on the Marias River.
Unpublished false-color IR aerial photography of the study area for the Townsend-Garrison 500 kilovolt transmission line (Scale = 1:48,000).
Unpublished map of winter and spring sharp-tailed grouse distribution in the study area for the Decker coal mine (Base = USGS Spring Gulch quadrangle; scale = 1:24,000).
[Referring to a person who is an expert in a particular area]
Source of expert information on the fisheries in Montana.
Collection of c. 2,500 titles (primarily journal articles) on weeds and herbicides.

Agencies, such as the U.S. Department of Energy, sometimes publish reports that they give various designations in the report (e.g., Technical Report, Analysis Report...). It is preferable to index these titles as:

"Coal strike impact methodologies, technical report."
rather than
"Technical report, coal strike impact methodologies."

or "Powder River regional coal, environmental impact statement, final."
rather than "Final environmental impact statement, Powder River regional coal."

By using this system, when searching an alphabetized list of titles all the documents will be listed together instead of in several locations.

Such as:
Powder River regional coal, environmental impact statement, amended.
Powder River regional coal, environmental impact statement, appendix.
Powder River regional coal, environmental impact statement, draft.
Powder River regional coal, environmental impact statement, final.

There are no rules on when to rearrange the title. Use common sense and keep in mind that the objective is to be able to retrieve the source easily.

6. CITATION

(254 characters.) Any material that is contained in the Author Field should not be repeated in the Citation field. Agency names should conform to WLN name authority format (Appendix C). For books and documents, list:

- Place of publication
- Publisher (if different from the author)
- Prepared for or Compiled for (if this information is available)
- Number of volumes (if more than one)
- Official designation, document number, contract number (DOE...)
- Optional descriptors: illus., tables, bib., appendix, index
- If resource maps are present within a document describe them (map of ...)
- International Standard Book Number (ISBN) or Library of Congress Card Number (LCCN) - do not list stock numbers
- Number of pages if known or "1 volume (various pagings)", this should always be the last item in the citation

Examples: "Boston, MA: Houghton Mifflin, ISBN 0-920656-42-0, 2 volumes (various pagings)."

"Fort Collins, CO: U.S. Fish and Wildlife Service, OBS-WELUT 78/32, 24 pp."

"Helena, MT: Prepared for U.S. Environmental Protection Agency, EPA-...., map of Silver Bow Creek near Butte, tables of chemical analysis, 300 pp."

For journal or periodical articles, spell out the journal name in full. Do not abbreviate unless absolutely necessary to fit the citation in the 254-character limit. (e.g., Use "Journal of Range Management 53(2):116-118", not "Jour. Range Mgmt." or "J. Rng. Manage". These journal entries would not be found if a search was performed for everything in the Journal of Range Management. Also many users of the index are not familiar enough with journal titles to know to which journal the abbreviation refers.

When the source document is only a portion of a compilation (e.g. a chapter, or a paper included in Proceedings from Symposia or Professional meeting) then the CITATION field must include information on both the paper (or chapter...) and the entire volume in which the paper was included.

Examples: [A paper from a Symposia]
"Pages 314-458 In G.B. Books, D.T. Trimball, and A.H. Hutton (eds.), Proceedings of a symposium on management of natural resource data. U.S. Forest Service, General Technical Report RM-34/78, 1 volume (various pagings)."

[If a book existed which had one chapter dealing with Montana]
Pages 200-240 in U.S. Dept. of Interior, Wild and Scenic Areas of the United States, a State by State Summary, 600 p.

For unpublished sources such as maps, aerial photographs, satellite imagery, and computer files, list the location (city and state) where the source is located, as well as the name, address and phone of the primary contact person or agency (if the name was not already included in the Author field).

Examples: "Helena, MT: Montana Dept. of Highways, Contact Harvey Hargett, MDH, 2701 Prospect Avenue, Helena, 444-2314."

"Denver, CO: U.S. Geological Survey, contact James Mason, U.S. Geological Survey, Box 25046, Federal Center, Denver, (303)345-5464."

For automated bibliographies or collections, describe the hardware and software used. (e.g., "Bozeman, MT: Montana Dept. of Fish, Wildlife and Parks, Contact Joyce Biggins, DFWP Research Lab, 586-3233, uses Lotus 123 on a Leading Edge Model D microcomputer.")

For maps, include a description of map dimensions in inches, or resolution in acres (e.g., "44 x 56", "Res. = 10 acres").

7. AUTHOR'S AFFILIATION (if appropriate)

(100 characters.) List the institutional affiliation of the senior author, if known, only if the author is affiliated with an organization different from the publisher. This will be left blank if an agency or institution is listed in the Author field.

8-9. KEYWORDS, SUBJECTS

(2 fields, 254 characters each.) These fields are intended to provide more information about the source, and to provide a place to list key words that have been obtained from the source. Keywords are meant to complement the subject codes and should never replace them, with one exception: if there is not enough room for all the subject codes. Do not list as keywords terms that

are included in the title or in any of the subject codes. Capitalize only proper names and place names. Separate keywords by a comma and a space; do not use slashes in the keyword field.

Every document will usually have at least a few keywords. Keywords should be short, specific, retrievable terms for further describing the content of the source. Keywords may include geographic names (e.g., streams, rivers, place names, etc.), project names (e.g., Broadwater Hydroelectric Project, Headwaters Resource Project), and other terms which might be helpful in retrieving that particular document. Keywords, specific to a document, can often be found by browsing the table of contents or abstract of the document.

The second keyword field, SUBJECTS, is intended primarily for lists of plants or animal species covered in the source. If possible, include the common names followed by the scientific name. This field can also be used to provide a continuation of the of the keywords in the first keyword field.

Avoid combining two concepts in one keyword or using keywords which either are redundant to subject codes or are too general.

Examples: "oil shale and tar sands" should be listed as "oil shale", "tar sands."

"area development" and "historical information" are much too general and could be covered by appropriate subject codes.

10. SUBJECT CODES

(4 fields, 27 characters each.) The list of subject codes used by the MNRI is an abbreviated thesaurus of the most important key terms used to describe the general subject content of the source. Use the three-letter hierarchical subject codes to describe the subject content of the technical material in the source. When indexing a document, the subject codes should be selected first, and then the keywords assigned.

A list of the current subject codes is ~~presented~~ in Appendix B. As the need arises, more specific subject codes will be added to this list, codes will never be removed. Each three-letter code is unique. Cooperators will be provided with updates of the subject code list.

The subject code system employed is hierarchical. There are four levels. The first-order codes are the most general and the fourth-order most specific. This ranking allows one to query the index either for very general or for very specific subject categories.

Even if the subject area of a source is very specific, the corresponding general subjects must also be included. For example, if TUR[bidity] fourth-order, is used as a subject code then the more general headings PHY[sical] third-order, QUA[lity] second order, and WAT[er resources] first-order, must also be entered.

All subject codes must be in upper case and separated by periods. The first field should contain only first-order subject codes, the second field only second-order codes, etc. A mixture of up to seven different codes can be entered in the appropriate field. This method allows fairly detailed description of subject area coverage even for resources that contain many different subjects.

In cases where the appropriate subject code field is not long enough to hold all the subject codes, include the extra subjects in the KEYWORD field, spelled out as keywords. Subject codes should always be used in preference to keywords (unless there isn't enough space in the SUBJECT CODE field).

There are two types of first-order subject codes. First, there are the general categories of natural resources (e.g., geology, soils, water resources). Second, there are some general descriptors which can be used in conjunction with any of the other first order categories (e.g., policy, regulation, statistics, classification). The subject code "MUL" is especially useful when indexing multi-disciplinary documents.

For example, a source dealing with policy implications of the impacts of weather modification on snowpack, vegetation, soil erosion, and turbidity could be described as follows:

First-order:	MET.SOI.IMP.PLC.WAT.BIO.
Second-order:	PRE.WMO.QUA.ERO.POL.SUR.VEG.
Third-order:	SNO.PHY.
Fourth-order:	TUR.

When the index is queried, this source would be retrieved if a search was made on any one of these codes.

Only codes that are listed in Appendix B may be used. Codes must be entered only in the appropriate level. Any additional subject codes will be added only by the MNRI staff, updates will be distributed to users.

Environmental impact statements (EIS's) are a special case with respect to subject analysis. All or nearly all natural resource categories must, by law, be considered. It is not necessary, therefore, to list each subject included, the first-order code "EIS" implies that all major subject areas are included in the document. Additional codes must be listed to indicate the type of project or action that's being evaluated by the EIS. An example of an EIS entry is in Appendix A.

11. TYPE OF SOURCE

(3 characters.) The type of source is described using one of the three-letter codes defined below. Examples of completed data entries are given in Appendix A.

DOC (Documents.) Books, articles, monographs, government documents (exclusive of environmental documents), thesis and dissertations, published and unpublished reports, unpublished manuscripts.

ENV (Environmental statements.) Environmental Impact Statements (EIS's), Environmental Assessments (EA's), Land Management Plans, Expanded Preliminary Reviews (PER's), and any other multi-disciplinary legal documents created to meet the requirements of the National or Montana Environmental Policy Acts. Environmental Impact Statements should always be entered as ENV's in the Type field.

MAP (Maps.) Any published or unpublished maps.

AER (Aerial imagery.) Aerial photographs and satellite imagery.

BIB (Bibliographies.) Bibliographies or directories of information sources, including automated cataloging systems.

AUT (Automated data files.) Any data maintained in machine readable format, including automated data files that contain digital or otherwise geographically referenced aerial data. Geographical information system data are included in this category.

COL (Collections.) Periodicals, special libraries, or special collections of books, maps, or reprints on a particular natural resource topic.

UNP (Unpublished.) All unpublished sources that do not fit into any of the above categories, including manual data files, file cabinets or "shoe boxes" of data, and persons who have expertise in a particular subject area. (Unpublished reports and manuscripts should be entered as DOCs.)

12. SHELFNOTES (Where Located)

(35 characters.) A list of where the resource can be obtained. Use standard codes for libraries and agency offices; other locations should be spelled out. Montana State Library (MSL) shelf holdings will have highest priority, other libraries will have second priority. Use standard WLN abbreviations for source libraries. List the call number following the library code. Any combination of up to three libraries can be listed in this field, if there is insufficient room for all shelfnotes, Montana State Library's must be listed. (A few of the WLN library location abbreviations are listed in Appendix C.)

13. STATES

(23 characters.) States included in the MNRI index: Montana, the seven states or Canadian provinces adjoining Montana, plus Washington and Oregon (Pacific Northwest). This includes: MT, ID, WY, ND, SA, AL, BC, WA, and OR. Use periods to separate codes (e.g, MT.WY.ID.). It is not necessary to list states not in this region.

Geographic Coverage of the Study Area

The most important feature of the MNRI system is its provision for several geographical access points. This feature allows users an enormous degree of flexibility in performing queries for a specific portion of Montana.

If a study covers the entire state, then you may use the following entries:

COUNTIES	STAT.
DFWP DISTRICTS	9
BASINS	STAT.
LATITUDE-NORTH	4900
LATITUDE-SOUTH	4423
LONGITUDE-EAST	10400
LONGITUDE-WEST	11603

If a study covers only a portion of Montana then the following system of determining latitude/longitude is suggested. Leave the geographic fields blank if the source is a handbook or of a general nature.

First, using a facsimile of the map in figure 1, carefully outline the area, or areas covered in the document. This information should be extracted from the interior of the document since often the title is misleading. Sometimes a study will have a section describing the range of the study. Hatch or color the outlined areas in, if desired, to make them stand out more.

For users and indexers unfamiliar with latitude/longitude see Appendix D for a short explanation.

14. COUNTIES

(75 characters.) List all the counties covered, even partially, by the area drawn as described above. Figure 2 shows codes used to indicate blocks of counties. These codes may be used instead of the individual county names if all the counties included in the block were included in the study area.

For individual counties enter the first four letters of the county name. This gives an unique identifier for each Montana county. (Note: Chouteau County is misspelled as "Choteau" on many maps, the correct spelling is Chouteau.) For blocks of counties, enter four-digit codes (NOWE, NOCE, NOEA, SOWE, SOCE, SOEA) as shown in Figure 2. For statewide studies, use the code STAT. This method will allow even the most oddly-shaped study area to be entered within the 75 characters allotted for this field.

15. DFWP DISTRICTS (Dept. of Fish, Wildlife, and Parks Regions) - optional

(6 characters.) This field, used primarily for fish and wildlife studies, indicates which of the seven Montana Department of Fish, Wildlife and Parks administrative regions are included (figure 3). Enter the number(s) of the region(s) covered by the study (e.g., 357 for a study covering regions 3,5, and 7); enter "9" for statewide studies. Do not put periods between the numbers.

16. DRAINAGE BASINS - optional

(35 characters.) This field is for use primarily with water resources or fisheries data source. Enter the one- or two-letter codes corresponding to the USGS Hydrologic Units covered (figure 4). Enter codes in upper case and separate all codes by periods. For example, "OC." indicates the Yaak River Drainage, "O." indicates the entire Kootenai River drainage (including the Yaak River), and "O.RJ." indicates the Kootenai River drainage plus the Stillwater River drainage of the Flathead River. (NOTE: for studies encompassing the entire Missouri River basin, the code "UM." can be used in place of "A.B.C.D.E.F.G." to save space. Likewise, for studies encompassing the entire Yellowstone River basin, the code "YR." can be used in place of "H.I.J.K.L."). For studies that cover large areas, use the combination of the least number of one- and two-letter codes that describe the area of coverage. For statewide studies, enter "STAT.".

17. LATITUDE and LONGITUDE

(Two fields of 4 characters each, two fields of 5 characters each.) Four fields are used to indicate the study area coverage. Draw a box around the study area. (This is called the "least rectangle of latitude and longitude.) A list of commonly encountered Least Rectangles is in Appendix D. For studies covering a group of areas draw only one box around the entire group of areas, (Appendices A and D have examples). Even though an area of coverage may extend beyond the boundaries of Montana, do not extend the least rectangle beyond the boundaries of the state.

In each field the first characters are degrees and the last two characters are minutes. Seconds are not stored in the MNRI Index. Estimate latitude and longitude to the nearest five minutes from the coverage maps; the template shown in Figure 5, if copied onto mylar or other transparent material, greatly improves the ease and accuracy of this task.

A statewide study would be described as follows:

Southernmost latitude:	4423
Northernmost latitude:	4900
Easternmost longitude:	10400
Westernmost longitude:	10603

18. COVERAGE DATES.

(13 characters.) When the dates of data coverage different from the publication date entered above, describe these dates in this field using the format MM/YY-MM/YY. For ongoing studies, list the starting dates, plus "ongoing: (e.g., "11/65-ongoing").

APPENDIX A

ENTRY FORMS OF INDEXED DOCUMENTS

APPENDIX B

PART 1: HIERARCHICAL LIST OF SUBJECT CODES

PART 2: ALPHABETICAL LIST OF SUBJECT CODES

APPENDIX B

PART 1. HIERARCHICAL LIST OF SUBJECT CODES

LAN Land lines
- PLS Public Land Survey (Township and Range)
- LAT Latitude and longitude
- COU County lines
- UTM Universal Transmercator
- OWN Ownership

TOP Topography
- REL Relief
- SLO Slope
- ASP Aspect
- FRM Landforms

AER Aerial imagery
- PHO Photography
- SAT Satellite imagery

MET Meteorology and climatology
- TEM Temperature
- PRE Precipitation
  - RAI Rain
  - SNO Snow
- SNP Snowpack
- SUN Insolation
- WIN Wind
- EVA Evapotranspiration and evaporation
- WMO Weather modification

AIR Air Quality

HDR Hydrology

WAT Water resources
- SUR Surface water
- GRO Groundwater
- QNT Quantity
- QUA Quality
  - Biological (use headings under BIO)
  - CHE Chemical
    - ORG Organics
    - ION Common Ions (including pH and specific conduct.)
    - NUT Nutrients
    - MTL Metals
    - DOB DO/BOD
    - RAD Radioactivity
  - PHY Physical
    - TMP Temperature
    - SED Sediment
    - TUR Turbidity
    - COL Color

ODO Odor

WUS Water Use
- CNS Consumptive
- NON Non consumptive
- IRR Irrigation
- PUB Public Supply (municipal)
- RUR Rural domestic
- IND Industrial
- LIV Livestock
- ISF Instream flow
- RSE Reservoir evaporation
- MNI Mining
- INT Inter-basin transfer
- WEL Wells
  - FLW Flowing wells
- SPR Springs
- DRA Drains
- GHP Groundwater heat pumps
- EVP Evaporation
- RSV Reservations
- WRI Water rights
  - RWR Reserved water rights

AQF Aquifer

SOI Soils
- CHM Chemical characteristics
  - SSS Saline/sodic soils
- PHC Physical characteristics
- ERO Erosion
- GNS Genesis
- SRV Survey

GEO Geology (other than minerals)
- GCH Geochemistry
- GMO Geomorphology
- GLA Glacial
- SDM Sedimentology
- SRF Surface
- SSF Subsurface
- FEA Unique features

MIN Minerals (other than energy resources)
- COP Copper
- SIL Silver
- CLY Clay
- BEN Bentonite
- URA Uranium
- GOL Gold
- PLA Platinum
- SAN Sand
- GRV Gravel
- CUT Open cut

PAL Paleontology

BIO Biological resources

- AQU Aquatic ecology
- TER Terrestrial ecology
- FLO Flora
  - VIR Viruses
  - BAC Bacteria
  - PHT Phytoplankton
  - PER Periphyton
  - MAC Macrophyton
  - FUN Fungi
  - VAS Vascular
- WIL Wildlife
  - MOL Molluscs
  - INS Insects
  - ARH Arachnids
  - CRS Crustaceans
  - ART Other arthropods
  - INV Other invertebrates (Microinvertebrates, Macroinvertebrates)
  - RPT Reptiles
  - AMP Amphibians
  - BIR Birds
  - MAM Mammals
- VEG Vegetative
  - PLT Palustrine
  - LAC Lacustrine
  - RIV Riverine or riparian
  - FRS Forest
  - SAV Savannah
  - GRS Grassland
  - SHR Shrubland
  - DES Desert
  - ALP Alpine
  - SBT Subterranean
  - MEA Meadow
  - WET Wetlands
  - COM Communities (general)
- FIS Fisheries

Note the following third-order descriptive terms can be used in conjunction with any subject codes under BIO:

- BEH Behavior
- FOO Food habits
- END Endangered or threatened species
- TAX Taxonomy
- LIF Life history
- HAB Habitat
- PRO Productivity
- HAR Harvest
- MOR Mortality
- TOX Toxins
- TEC Techniques

MOV Movements or migrations
REP Reproduction
DIS Distribution
POP Population ecology
LIS Lists of species or communities
DIV Diversity
ABU Abundance
PAT Pathology and disease
HUN Hunting

AGR Agriculture
CRO Crop production
GRA Grazing
FOR Forestry
WEE Weeds
PES Pesticides
LVS Livestock

COV Land cover (Similar to VEG and TER.COM but includes land uses)

HAZ Hazards (Environmental hazards and/or constraints)
SEI Seismic risk
LSL Landslides and land movement
FLD Flooding

FIR Fire

ENE Energy
OIL Petroleum
CRU Crude oil
PPR Petroleum products
GAS Natural gas
COA Coal
STM Strip mining
SYN Synfuels
SLU Coal slurry
ELE Electric power (collective term = THE.HYD.)
HYD Hydroelectric
SSH Small-scale hydro
THE Thermoelectric power
CFP Coal-fired power plants
MHD Magnetohydrodynamics
COG Cogeneration
TRA Transmission facilities
PIP Pipelines
SIT Siting studies
REN Renewable (collective term = "1.ENE.2.BMS.GTH.SOL.WIN.HYD.")
BMS Biomass energy
HCB Hydrocarbon fuels from biomass
ALC Alcohol fuels
SWS Solid wastes
WDF Wood fuel
GTH Geothermal energy
SOL Solar energy

WND Wind energy
ENC Energy conservation
IDS Industrial
CMM Commercial
IST Institutional
RES Residential

USE Land use and management
EXC Land exchanges
SPE Specially managed areas
WLD Wilderness
PAR Parks
WRF Wildlife refuges
WSR Wild and scenic rivers
RNA Research natural areas
NAT Nature preserves
WTS Watersheds
SUB Subdivision
ROW Rights-of-way

HER Heritage
TOO Protection tools
PRT Protection organization
MAN Management techniques

IMP Impact
POL Pollution
WAS Hazardous wastes
NOI Noise

MIT Mitigation
RCL Reclamation

TRN Transportation
HWY Highway
ARP Airports
RRS Railroads

REC Recreation

CUL Cultural resources
ARC Archaeology
HIS Historic

SOC Socioeconomic and sociological

VIS Visual resources

ECN Economic

EIS Environmental impact statements, EA's or expanded PER's

MUL Multidisciplinary documents other than EIS's

Note: The following first-order subject codes can be used in conjunction with any other first-order subject codes:

PLC Policy

PLN Planning

LEG Legislation

REG Regulation

STA Statistics

SUP Supply of the resource

DEM Demand of the resource

FRC Forecasting

DEV Development

PRI Pricing

ENG Engineering

EDU Education

MAR Marketing

MTH Methods

CON Conservation

MNG Management

CLA Classification

PART 2. ALPHABETICAL LIST OF SUBJECT CODES

Order	Code	Key Word and Higher-order Subjects
3	ABU	Abundance (1.BIO)
1	AER	Aerial imagery
1	AGR	Agriculture
1	ALC	Alcohol fuels (1.ENE 2.BMS)
3	ALP	Alpine (1.BIO 2.VEG)
3	AMP	Amphibians (1.BIO 2.WIL)
2	AQF	Aquifer (1.WAT)
2	AQU	Aquatic ecology (1.BIO)
2	ARC	Archaeology (1.CUL)
3	ARH	Arachnids (1.BIO 2.WIL)
2	ARP	Airports (1.TRN)
3	ART	Other arthropods (1.BIO 2.WIL)
2	ASP	Aspect (1.TOP)
3	BAC	Bacteria (1.BIO 2.FLO)
3	BEH	Behavior (1.BIO)
2	BEN	Bentonite (1.MIN)
1	BIO	Biological resources
3	BIR	Birds (1.BIO 2.WIL)
2	BMS	Biomass energy (1.ENE)
3	CFP	Coal-fired power plants (1.ENE 2.THE)
3	CHE	Chemical (1.WAT 2.QUA)
2	CHM	Chemical characteristics (1.SOI)
1	CLA	Classification
2	CLY	Clay (1.MIN)
3	CMM	Commercial (1.ENE 2.ENC)
3	CNS	Consumptive (1.WAT 2.WUS)
2	COA	Coal (1.ENE)
3	COG	Cogeneration (1.ENE 2.THE)
4	COL	Color (1.WAT 2.QUA 3.PHY)
3	COM	Communities (1.BIO 2.VEG)
1	CON	Conservation
2	COP	Copper (1.MIN)
2	COU	County lines (1.LAN)
1	COV	Land cover (similar to VEG and TER.COM but includes land uses)
2	CRO	Crop production (1.AGR)
3	CRS	Crustaceans (1.BIO 2.WIL)
3	CRU	Crude oil (1.ENE 2.OIL)
1	CUL	Cultural resources
2	CUT	Open cut (1.MIN)
1	DEM	Demand of the resource
3	DES	Desert (1.BIO 2.VEG)
1	DEV	Development
3	DIS	Distribution (1.BIO)
3	DIV	Diversity (1.BIO)
4	DOB	DO/BOD (1.WAT 2.QUA 3.CHE)
3	DRA	Drains (1.WAT 2.WUS)
1	ECN	Economic
1	EDU	Education

1	EIS	Environmental impact statements, EA's or expanded PER's
2	ELE	Electric power (collective term = THE.HYD) (1.ENE)
2	ENC	Energy conservation (1.ENE)
3	END	Endangered or threatened species (1.BIO)
1	ENE	Energy
1	ENG	Engineering
2	ERO	Erosion (1.SOI)
2	EVA	Evapotranspiration and evaporation (1.MET)
3	EVP	Evaporation (1.WAT 2.WUS)
2	EXC	Land exchanges (1.USE)
2	FEA	Unique features (1.GEO)
1	FIR	Fire
2	FIS	Fisheries (1.BIO)
2	FLD	Flooding (1.HAZ)
2	FLO	Flora (1.BIO)
1	FRC	Forecasting
2	FRM	Landforms (1.TOP)
3	FRS	Forest(1.BIO 2.VEG)
3	FUN	Fungi (1.BIO 2.FLO)
2	GAS	Natural gas (1.ENE)
2	GCH	Geochemistry (1.GEO)
1	GEO	Geology (other than minerals)
3	GHP	Groundwater heat pumps (1.WAT 2.WUS)
2	GLA	Glacial (1.GEO)
2	GMO	Geomorphology (1.GEO)
2	GNS	Genesis (1.SOI)
2	GOL	Gold (1.MIN)
2	GRA	Grazing (1.AGR)
2	GRO	Groundwater (1.WAT)
3	GRS	Grassland (1.BIO 2.VEG)
2	GRV	Gravel (1.MIN)
2	GTH	Geothermal energy (1.ENE)
3	HAB	Habitat (1.BIO)
3	HAR	Harvest (1.BIO)
1	HAZ	Hazards (Environmental hazards and/or constraints)
3	HCB	Hydrocarbon fuels from biomass (1.ENE 2.BMS)
1	HDR	Hydrology
1	HER	Heritage
2	HIS	Historic (1.CUL)
3	HUN	Hunting (1.BIO)
2	HWY	Highway (1.TRN)
2	HYD	Hydroelectric (1.ENE)
3	IDS	Industrial (1.ENE 2.ENC)
1	IMP	Impact
3	IND	Industrial (1.WAT 2.WUS)
3	INS	Insects (1.BIO 2.WIL)
3	INT	Inter-basin transfer (1.WAT 2.WUS)
3	INV	Other invertebrates (microinvertebrates, macroinvertebrates) (1.BIO 2.WIL)
4	ION	Common ions (including pH and specific conduct.) (1.WAT 2.QUA. 3.CHE)

3	IRR	Irrigation (1.WAT 2.WUS)
3	ISF	Instream flow (1.WAT 2.WUS)
3	IST	Institutional (1.ENE 2.ENC)
3	LAC	Lacustrine (1.BIO 2.VEG)
1	LAN	Land lines
2	LAT	Latitude and longitude (1.LAN)
1	LEG	Legislation
3	LIF	Life history (1.BIO)
3	LIS	Lists of species or communities (1.BIO)
3	LIV	Livestock (1.WAT 2.WUS)
2	LSL	Landslides and land movement (1.HAZ)
2	LVS	Livestock (1.AGR)
3	MAC	Macrophyton (1.BIO 2.FLO)
3	MAM	Mammals (1.BIO 2.WIL)
3	MAN	Management techniques (1.HER 2.TOO)
1	MAR	Marketing
3	MEA	Meadow (1.BIO 2.VEG)
1	MET	Meteorology and climatology
3	MDH	Magnetohydrodynamics (1.ENE 2.THE)
1	MIN	Minerals (other than energy resources)
1	MIT	Mitigation
1	MNG	Management
3	MNI	Mining (1.WAT 2.WUS)
3	MOL	Molluscs (1.BIO 2.WIL)
3	MOR	Mortality (1.BIO)
3	MOV	Movements or migrations (1.BIO)
1	MTH	Methods
4	MTL	Metals (1.WAT 2.QUA 3.CHE)
1	MUL	Multidisciplinary documents other than EIS's
3	NAT	Nature preserves (1.USE 2.SPE)
2	NOI	Noise pollution (1.IMP)
3	NON	Non-consumptive (1.WAT 2.WUS)
4	NUT	Nutrients (1.WAT 2.QUA 3.CHE)
4	ODO	Odor (1.WAT 2.QUA 3.PHY)
2	OIL	Petroleum (1.ENE)
4	ORG	Organics (1.WAT 2.QUA 3.CHE)
2	OWN	Ownership (1.LAN)
1	PAL	Paleontology
3	PAR	Parks (1.USE 2.SPE)
3	PAT	Pathology and disease (1.BIO)
3	PER	Periphyton (1.BIO 2.FLO)
2	PES	Pesticides (1.AGR)
2	PHC	Physical characteristics (1.SOI)
2	PHO	Photography (1.AER)
3	PHT	Phytoplankton (1.BIO 2.FLO)
3	PHY	Physical (1.WAT 2.QUA)
2	PIP	Pipelines (1.ENE)
2	PLA	Platinum (1.MIN)
1	PLN	Planning
1	PLC	Policy
2	PLS	Public land survey (township and range) (1.LAN)

3	PLT	Palustrine (1.BIO 2.VEG)
2	POL	Pollution (1.IMP)
3	POP	Population ecology (1.BIO)
3	PPR	Petroleum products (1.ENE 2.OIL)
2	PRE	Precipitation (1.MET)
1	PRI	Pricing
3	PRO	Productivity (1.BIO)
3	PRT	Protection organization (1.HER 2.TOO)
3	PUB	Public supply (municipal) (1.WAT 2.WUS)
2	QNT	Quantity (streamflow) (1.WAT)
2	QUA	Quality (1.WAT)
4	RAD	Radioactivity (1.WAT 2.QUA 3.CHE)
3	RAI	Rain (1.MET 2.PRE)
2	RCL	Reclamation and revegetation (1.MIT)
1	REC	Recreation
1	REG	Regulation
2	REL	Relief (1.TOP)
2	REN	Renewable (collective term = "1.ENE.2.BMS.GTH.SOL.WIN.HYD.") (1.ENE)
3	REP	Reproduction (1.BIO)
3	RES	Residential (1.ENE 2.ENC)
3	RIV	Riverine or riparian (1.BIO 2.VEG)
3	RNA	Research natural area (1.USE 2.SPE)
2	ROW	Rights-of-way (1.USE)
3	RPT	Reptiles (1.BIO 2.WIL)
2	RRS	Railroads (1.TRN)
3	RSE	Reservoir evaporation (1.WAT 2.WUS)
3	RSV	Reservations of water (1.WAT 2.WUS)
3	RUR	Rural domestic (1.WAT 2.WUS)
4	RWR	Reserved water rights (1.WAT 2.WUS 3.WRI)
2	SAN	Sand (1.MIN)
2	SAT	Satellite imagery (1.AER)
3	SAV	Savannah (1.BIO 2.VEG)
3	SBT	Subterranean (1.BIO 2.VEG)
2	SDM	Sedimentology (1.GEO)
4	SED	Sediment (1.WAT 2.QUA 3.PHY)
2	SEI	Seismic risk (1.HAZ)
3	SHR	Shrubland (1.BIO 2.VEG)
2	SIL	Silver (1.MIN)
2	SIT	Siting studies (1.ENE)
2	SLO	Slope (1.TOP)
3	SLU	Coal slurry (1.ENE 2.COA)
3	SNO	Snow (1.MET 2.PRE)
2	SNP	Snowpack (1.MET)
1	SOC	Socioeconomic and sociological
1	SOI	Soils
2	SOL	Solar energy (1.ENE)
2	SPE	Specially managed areas (1.USE)
3	SPR	Springs (1.WAT 2.WUS)
2	SRF	Surface (1.GEO)
2	SRV	Survey (1.SOI)

2	SSF	Subsurface (1.GEO)
3	SSH	Small-scale hydro (1.ENE 2.HYD)
3	SSS	Saline/sodic soils (1.SOI 2.CHM)
1	STA	Statistics
3	STM	Strip mining (1.ENE 2.COA)
2	SUB	Subdivision (1.USE)
2	SUN	Insolation (1.MET)
1	SUP	Supply of the resource
2	SUR	Surface water (1.WAT)
3	SWS	Solid wastes (1.ENE 2.BMS)
3	SYN	Synfuels (1.ENE 2.COA)
3	TAX	Taxonomy (1.BIO)
3	TEC	Techniques (1.BIO)
2	TEM	Temperature (1.MET)
2	TER	Terrestrial ecology (1.WAT)
2	THE	Thermoelectric power (1.ENE)
4	TMP	Temperature (1.WAT 2.QUA 3.PHY)
2	TOO	Protection tools (1.HER)
1	TOP	Topography
3	TOX	Toxins (1.BIO)
2	TRA	Transmission facilities (1.ENE)
1	TRN	Transportation
4	TUR	Turbidity (1.WAT 2.QUA 3.PHY)
2	URA	Uranium (1.MIN)
1	USE	Land use and management
2	UTM	Universal transmercator (1.LAN)
3	VAS	Vascular (1.BIO 2.FLO)
3	VIR	Viruses (1.BIO 2.FLO)
1	VIS	Visual resources
3	WAS	Hazardous wastes (1.IMP 2.POL)
1	WAT	Water resources
3	WDF	Wood fuel (1.ENE 2.BMS)
2	WEE	Weeds (1.AGR)
3	WEL	Wells (1.WAT 2.WUS)
3	WET	Wetlands (1.BIO 2.VEG)
2	WIL	Wildlife (1.BIO)
2	WIN	Wind (1.MET)
3	WLD	Wilderness (1.USE 2.SPE)
2	WMO	Weather modification (1.MET)
2	WND	Wind energy (1.ENE)
3	WRF	Wildlife refuges (1.USE 2.SPE)
3	WRI	Water rights (1.WAT 2.WUS)
3	WSR	Wild and scenic rivers (1.USE 2.SPE)
3	WTS	Watersheds (1.USE 2.SPE)
2	WUS	Water use (1.WAT)

APPENDIX C

WLN NAME AUTHORITY

STATUTE CODES

WLN LIBRARY ABBREVIATIONS

APPENDIX C

PARTIAL WLN NAME AUTHORITY LIST
for
STATE AND FEDERAL AGENCIES

Federal Energy Regulatory Commission, Office of Electric Power Regulation.
Federal Highway Administration, Office of Federal Highway Projects.
Federal Power Commission, Bureau of Power.
Interstate Commerce Commission, Office of Transportation Analysis, Section of Energy and Environment.
Missouri River Basin Commission.
Montana Dept. of Agriculture.
Montana Dept. of Fish and Game.
Montana Dept. of Fish and Game, Parks Division.
Montana Dept. of Fish, Wildlife, and Parks.
Montana Dept. of Health and Environmental Sciences, Air Quality Bureau.
Montana Dept. of Health and Environmental Sciences, Environmental Sciences Division.
Montana Dept. of Health and Environmental Sciences, Solid Waste Management Bureau.
Montana Dept. of Health and Environmental Sciences, Subdivision Bureau.
Montana Dept. of Health and Environmental Sciences, Water Quality Bureau.
Montana Dept. of Highways.
Montana Dept. of Highways, Planning and Research Bureau.
Montana Dept. of Livestock, Brands Enforcement Division.
Montana Dept. of Natural Resources and Conservation.
Montana Dept. of Natural Resources and Conservation, Energy Division.
Montana Dept. of Natural Resources and Conservation, Forestry Division.
Montana Dept. of Natural Resources and Conservation, Water Resources Division.
Montana Dept. of State Lands.
Montana Power Company.
National Park Service.
National Park Service, Denver Service Center.
U.S. Army Engineer District, Omaha Nebraska.
U.S. Army Engineer District, Seattle, Washington.
U.S. Army Engineer District, Missouri River, Omaha, Nebraska.
U.S. Bureau of Indian Affairs, Billings Area Office.
U.S. Bureau of Indian Affairs, Planning Support Group.
U.S. Bureau of Land Management.
U.S. Bureau of Land Management, Billings District.

U.S. Bureau of Land Management, Butte District.
U.S. Bureau of Land Management, Dillon District.
U.S. Bureau of Land Management, Lewistown District.
U.S. Bureau of Land Management, Miles City District.
U.S. Bureau of Land Management, Missoula District.
U.S. Bureau of Land Management, Montana State Office.
U.S. Bureau of Land Management, Oregon State Office.
U.S. Bureau of Reclamation.
U.S. Dept. of Energy, Bonneville Power Administration.
U.S. Dept. of Energy, Western Area Power Administration.
U.S. Dept. of Health, Education, and Welfare, Region VIII.
U.S. Dept. of Transportation.
U.S. Environmental Protection Agency, Montana Office.
U.S. Federal Power Commission, Bureau of Natural Gas.
U.S. Fish and Wildlife Service.
U.S. Forest Service.
U.S. Forest Service, Beaverhead National Forest.
U.S. Forest Service, Bitterroot National Forest.
U.S. Forest Service, Custer National Forest.
U.S. Forest Service, Deerlodge National Forest.
U.S. Forest Service, Flathead National Forest.
U.S. Forest Service, Gallatin National Forest.
U.S. Forest Service, Helena National Forest.
U.S. Forest Service, Intermountain Region.
U.S. Forest Service, Kaniksu National Forest.
U.S. Forest Service, Kootenai National Forest.
U.S. Forest Service, Lewis and Clark National Forest.
U.S. Forest Service, Lolo National Forest.
U.S. Forest Service, Northern Region.
U.S. Forest Service, Shoshone National Forest.
U.S. Forest Service, Targhee National Forest.
U.S. Geological Survey.
U.S. Geological Survey, Water Resources Division.
U.S. Office of Surface Mining, Reclamation, and Enforcement.
U.S. Soil Conservation Service.

ABBREVIATIONS OF STATUTES COMMONLY REFERENCED IN ENVIRONMENTAL DOCUMENTS

CAA	Clean Air Act
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FWPCA	Federal Water Pollution Control Act
FWCA	Fish and Wildlife Coordination Act
FRRRPA	Forest and Rangeland Renewable Resources Planning Act
MLA	Mineral Leasing Act of 1920
MAPA	Montana Administrative Procedures Act
MAA	Montana Antiquities Act
MCAA	Montana Clean Air Act
MEPA	Montana Environmental Policy Act
MHRL	Montana Hard Rock Law
MFSA	Montana Major Facility Siting Act
MMMRA	Montana Metal Mine Reclamation Act
MSISA	Montana Sanitation in Subdivisions Act of 1947
MSUMRA	Montana Strip and Underground Mine Reclamation Act
MUSA	Montana Utility Siting Act
MWQA	Montana Water Quality Act
MWSP	Montana Water Supply Act of 1947
MWUA	Montana Water Use Act of 1973
MWSTA	Montana Wilderness Study Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OWA	Omnibus Wilderness Act of 1976
OCMRA	Open Cut Mining and Reclamation Act
PURPA	Public Utilties Regulatory Policies Act of 1978
SMCRA	Surfacr Mining Control and Reclamation Act
WQA	Water Quality Act
WSRA	Wild and Scenic Rivers Act
WA	Wilderness Act of 1964

APPENDIX D

INTRODUCTION TO GEOGRAPHICS

Latitude/longitude
Map Scale Computations
Quickie Guide to Township and Range

List of Commonly Encountered Least Rectangles

INTRODUCTION TO GEOGRAPHICS

This is an introduction to latitude/longitude, township and range, and map scale computations for index users who are not familiar with these concepts. Using and calculating geographic information is not difficult once you have some knowledge of these methods. Many people have not had an opportunity to use maps.

Geographics are used to:

-locate an area on a map, or globe

-describe the area so other people may also accurately locate the same area

An example of the usefulness of geographically locating an area using latitude longitude is: if someone has purchased some land and wants to put a well in. He could tell the drilling company to go past the fourth tree after the third bend in the creek. The drilling company might find his land or might not. Using latitude and longitude the drilling company will know exactly where the boundaries of this land are. The ability to express a location in geographic terms is valuable knowledge.

LATITUDE AND LONGITUDE

To facilitate locating any spot on the earth, a geographic grid has been superimposed over the globe. The has line of longitude running from the north pole to the south pole. The circles of latitude are parallel to the equator.

Latitude and longitude are measured in degrees, minutes, and seconds. Each degree can be divided into 60 minutes, each minute can be further divided into 60 seconds. We will only use degrees and minutes to locate areas in Montana. (One degree of longitude does not cover the same amount of area as one degree of latitude.)

Longitude lines are numbered from east to west, starting with the "Greenwich" longitude line as 0 degrees. (This particular line runs through the town of Greenwich, England, home of the Royal Observatory). There are 360 degrees of longitude around the equator (the same as the number of degrees in a circle).

Latitude "circles" sun parallel to the equator. The equator is labeled as 0 latitude. North of the equator the latitude circles run from 0 , at the equator to 90 N, at the north pole. South of the equator the latitude circles run from 0 , at the equator, to 90 S, at the south pole. For purposes of locating areas in Montana, drop the 'N', it is not necessary, since all areas in Montana are north of the equator. Latitude is measured from south to north.

To determine the latitude and longitude of an area, first draw the area on a copy of the Montana map, an example is shown in figure 26. Next draw a box around the area. When the study covers several areas which are not connected, include all the areas in a single box.

Longitude is read from right to left. Therefore to find the east longitude, find the largest line of longitude just to the right of the study area. In the example this is 110 . Put the template with the 0 minute side or 110 (see example), and going from right to left try to get within 5 minutes of the right-most part of the study area. The area in the example is about 25 minutes (25'), write this down. The east longitude is 11025.

To find the west longitude, a similar method can be used. Find the largest line of longitude within the study area, in the example it is 111 . Then use the template to find the minute measurement of the far left edge, here 55'. The west longitude is 11155. Do not read the template from left to right, a common error.

Latitude is read from south to north (bottom to top). To find the south latitude of the study area, find the largest line of latitude below the study area. In the example it is 46 . Using the template measure up from this line to the most southern point of the study area, here 05', the south latitude is 4605.

The north latitude is found by finding the largest line of latitude within the study area, in the example 47 . Then using the template read up to the northernmost point of the study area, estimate the reading of that point to the nearest 5 degrees, here 25', the north latitude is 4725.

The case of an area which does not cross lines of latitude or longitude is slightly different.

The accuracy of the latitude/longitude measurements will depend on how carefully the study area was transferred to the map and how well the estimation is done.

TOWNSHIP AND RANGE

Another common method of locating a particular area is by township and range. Unlike latitude and longitude which cover the entire globe, township and range are state dependant.

Each state is divided up into townships, ranges, and sections. If you know the township and range, it is easy to determine the lat/long. Township and range information is often given on maps or in site-specific descriptions in documents.

Townships are 36 square miles (6x6 miles). These are shown as boxes on USGS maps. Townships are further broken down into section which are 1 square mile each. Each section is assigned a number, however it is not necessary to get down to this level of site specific detail for NRIS indexing.

The numbers for townships and ranges start at the Principal Meridian. In Montana, the Principal Meridian is located near Three Forks, very close to Willow Creek.

Work east-west for township, and south-north for range.

MAP SCALES AND CONVERSIONS

If the map maker has been at all conscientious you will find the scale of the map depicted on the map somewhere.. The scale will probably be expressed as one of the following: 1:500,000, 1/250,000, or 1 inch equals 8 miles. The first number in a scale will be the distance measurement on the map. The second number will be the actual ground distance. The first two scales listed are of the type called "unitless ratios". A unitless ratio has no units and the first measurement listed is always a 1. Any unit (inches, feet, miles, kilometers, centimeters) may be applied to it.

Therefore 1:500,000 may represent:

1 inch = 500,000 inches or
1 foot = 500,000 feet...

where the units for both measurements are the same.

The third scale, 1 inch equals 8 miles, is not expressed as a unitless ratio but it can be converted to one. To convert form a scale with units to a unitless ratio you must convert the units of ground measurement and map measurement so that they are the same. Therefore to convert "1 inch equals 8 miles" to a unitless ratio, convert the miles to inches.

Some helpful conversion factors:

1 mile	= 5,280 feet
1 mile	= 63,360 inches
1 inch	= 2.54 centimeters
1 centimeter	= 0.394 inches

To convert 8 miles to inches:

$$8 \text{ miles} \times 63{,}360 \frac{\text{inches}}{\text{mile}} = 506{,}880 \text{ inches}$$

then the unitless ratio is: 1 : 506,880 and is read as 1 unit on the map represents 506,880 units on the ground.

Another example:

Convert the following scale to a unitless ratio --

5 inches = 7 miles

$$7 \text{ miles} \times 63{,}360 \frac{\text{inches}}{\text{mile}} = 443{,}520 \text{ inches}$$

this gives you the ratio 5 : 443,520

then divide through by 1 to get the map distance to be a 1 instead of a 5.

5 / 5 = 1, and 443,520 / 5 = 88,704
therefore the final unitless ratio to be used is 1 : 88,704.

LATITUDE LONGITUDE OF LEAST RECTANGLE OF COMMONLY ENCOUNTERED AREAS

Location	North	South	East	West
Absaroka-Beartooth Wilderness	4545	4500	10915	11055
Beaverhead National Forest	4605	4423	11115	11355
Bitterroot National Forest	4640	4525	11335	11440
Bitterroot River	4640	4530	11355	11420
Boulder River Drainage	4620	4550	11145	11210
Bowdoin National Wildlife Refuge	4825	4805	10735	10740
Cabinet Gorge Reservoir	4810	4800	11550	11600
Canyon Ferry Reservoir	4645	4623	11130	11145
Charles M. Russell Wildlife Refuge	4805	4725	10610	10855
Clark Fork River (mainstream)	4900	4423	11235	11603
Clark Fork River (upper)	1735	4555	11230	11400
Deerlodge National Forest	4650	4525	11200	11355
East of the Continental Divide	4900	4423	10400	11410
Flathead Basin (upper)	4900	4820	11250	11410
Flathead Lake	4805	4740	11400	11425
Flathead National Forest	4900	4730	11250	11440
Fort Peck Reservoir	4810	4730	10610	10810
Gallatin National Forest	4600	4423	11045	11130
Glacier National Park	4900	4820	11310	11430
Helena National Forest	4715	4610	11100	11300
Hungry Horse Reservoir	4830	4755	11335	11400
Kootenai National Forest	4900	4740	11350	11603
Kootenai River	4840	4810	11515	11603
Lake Koocanusa	4900	4830	11505	11520
Lewis and Clark National Forest	4830	4610	10900	11340
Lolo National Forest	4805	4620	11245	11603
Missouri River (mainstem)	4810	4555	10400	11205
Missouri River Basin (upper)	4900	4423	10400	11300
Mystic Lake	4525	4520	10935	10945
Noxon Reservoir	4800	4740	11540	11550
Rattlesnake Creek	4710	1650	11350	11400
Rock Creek (upper)	4635	4625	11320	11330
Silver Bow Creek	4615	4600	11220	11240
West of the Continental Divide	4900	4423	11230	11603
Willow Creek	4825	4810	10615	10640
Yellowstone County	4630	4525	10715	10845
Yellowstone National Park	4505	4433	11000	11110
Yellowstone River	4745	4500	10400	11055

APPENDIX E

Blank Entry Form
dBase III+ File Structure

APPENDIX F

STANDARDS for ENTERING SUPPLEMENTAL DESCRIPTIVE INFORMATION FOR SPECIAL TYPES OF RECORDS

APPENDIX F

STANDARDS FOR ENTERING SUPPLEMENTAL

DESCRIPTIVE INFORMATION FOR SPECIAL TYPES OF RECORDS

Certain types of sources (for example, computer data bases) require more detailed description than is possible using the fields described in Chapter 2. In this chapter, standards are presented for entering this detailed information.

ABSTRACTS (optional)

Some people may wish to include an abstract of the source or additional descriptive notes that won't fit in the fields provided for in Chapter 2. This information may be included in abstract fields. Up to five fields may be used; the maximum number of characters in each field is 254.

For maps, use the abstract fields to describe the map legend and lists of mapping units.

For environmental statements (and certain documents, if desired), the first abstract field (and in some cases the second as well) is used to list the subject codes (as listed in Appendix A), additional subject descriptors, and the scale of any maps contained in the document that include useful or original information on natural resources. Number each map in sequence. Use a space between each map entry and follow each subject code with a period. If the subject codes don't provide enough detail, add lower case words after the subject codes as needed to adequately describe the subject of the map. End each entry with the scale of the map (unless the maps are the scale, in which case the entry would begin with "All maps [give scale]"). For example the entry for an EIS containing three maps, one on general soil series, one of vegetation types, and one on sage grouse distribution would be:

All maps 1 : 500,000 unless otherwise noted.
(1)SOI.series. (2)TER.COM.potential native vegetation.
(3)TER.FAU.BIR.sage grouse.1 : 250,000.

If there is not sufficient space for all maps in one field, continue entry into the second field. (Use this type of entry only in the Abstract, do not use it in the regular Subject Code fields.

NOTE: material in abstract should not duplicate descriptions already entered in other fields.

ADDITIONAL FIELDS FOR ENVIRONMENTAL STATEMENTS

Table 2 summarizes the additional fields used for environmental statements. A more detailed description of each follows. (NOTE: NRIS has already indexed nearly all Montana EIS's).

1. Statute

(45 characters.) Describe the law under which the assessment was made. Most state EIS's were made under the MEPA, most federal NEPA (use abbreviations). Other key laws and their abbreviations are listed in Appendix C.

2. Project Type

(20 characters.) Describe the types of project or action triggering the assessment (forest planning, coal mine, transmission line, etc.).

TABLE 2

RECOMMENDED FIELDS OF INFORMATION FOR ENVIRONMENTAL STATEMENTS

Field Contents	Field Length (characters)	dBase III Field Name
Statute(s) under which document was produced	45	STATUTE
Project Type	20	PROJ_TYPE
Proposer	50	PROPOSER
Date of PER (if any)	5	PER_DATE
Date of Draft (if any)	5	DRAFT_DATE
Date of Final (if any)	5	FINAL_DATE

3. Proposer

(50 characters.) List the name of entity proposing the action triggering the assessment.

4. Date of PER

(5 characters.) MM/YY Preliminary Environmental Review (PER) was issued (if any).

5. Date of Draft EIS

(5 characters.) MM/YY draft EIS issued (if any).

6. Date of Final EIS

(5 characters.) MM/YY final EIS issued (if any).

ADDITIONAL FIELDS FOR AUTOMATED DATA FILES

Automated (that is, computerized) data files are a special type of source that requires more detailed description. For these sources, the additional descriptors listed in Table 3 are used.

TABLE 3

ADDITIONAL FIELDS OF INFORMATION FOR AUTOMATED DATA FILES

Field Contents	Field Length (characters)	dBase III Field Name
Acronym. List standard acronym (if any).	20	ACRONYM
Purpose. Describe in general terms the of the data file.	55	PURPOSE
Structure. List two-digit code for data structure (SS = sorted sequential; IS = indexed sequential; RE = relational)	2	STRUCTURE
Contact. List name, address, and telephone number of primary contact person.	75	CONTACT
Status. O = operational, D = under development, M = under modification	1	STATUS
Availability. Describe availability to users outside the agency: U = unlimited, L = limited, C = Confidential or proprietary.	1	AVAIL
On-line access? Is online access available? Y/N.	1	ONLINE
Interactive? Can data be accessed interactively? Y/N.	1	INTERACT
PC Access? Can data be transferred to a diskette readable by a microcomputer? Y/N	1	PC_ACCESS
End-user Operated? Can system be operated by end user? Y/N.	1	END-USER
Data Base? Is the file a data base? Y/N	1	DATA_BASE
Output. Describe output media: P = printout, M = magnetic tape, D = diskette.	3	OUTPUT
Storage Media. M = magnetic tape, H = hard disk, D = diskette.	3	STORAGE

Size of Data File (in megabytes).	6	MEGABYTES
Hardware. List makes and models of the computer(s) on which the data base resides.	40	HARDWARE
Location. Give address where hardware resides	55	LOCATION
Operating System. Describe operating system.	20	OPER_SYST
Language. List the software language(s) used.	35	LANGUAGE
Data Base Management System (if any).	20	DBMS
Documentation. Give MNRI code number of documentation entry, or 999999 if none.	6	DOCUM
Other Agencies Who Access the System (if any).	35	OTHERS
Year Implemented (last two digits only).	2	IMP-YR
Date of Last Modification (MMYY).	4	LAST_MOD
Frequency of Input. D = daily, W = weekly, M = monthly, A = annually, Y = less than once every 2 years.	1	IN_FREQ
Frequency of Output (as above).	1	OUT-FREQ
Sources of Data in System.	254	SOURCES
Primary Users of System.	45	USERS
Will the agency share data with outside users? Y/N.	1	WILL_SHARE
Conditions for access. (lease, exchange, subscription fee, etc.; costs for above)	60	CONDITION
How can data be transferred to other users? (if through an online communications link, include modem type, software, and speed.)	60	TRANSFER
Support. List support organization and type of support provided.	40	SUPPORT

Minimum Memory Required for Operation of Software	6	MIN_MEM
Capacity of System. (including main memory and disk storage).	50	CAPACITY
Maximum No. of Simultaneous Users.	2	NO_USERS
Federal Repository(ies) to Which Data are Supplied (e.g., STORET, WATSTORE).	25	FED_REPOS
Comments.	254	COMMENTS
ADDITIONAL FIELDS USED ONLY FOR DIGITAL DATA FILES:		
What Software is used for Digitizing? Overlaying?	35	SOFTWARE
Coordinate System (Latitude/Longitude, UTM, etc.)	30	COORD
Spacial Data Type (P = point, L = line, P = polygon, G = grid-cell.)	4	SPATIAL
Minimum Level to Which Data are Aggregated (acres).	4	AGGREG
Peripheral Devices (such as digitizers, plotters)	75	PERIPH
Output Products Available (such as statistical summaries, maps, etc. Indicate scale(s) at which maps can be printed).	55	OUT_PROD
Does the System have Overlay Capacity? Y/N	1	OVERLAY
Layers. List and describe each overlay in the system, and indicate the scale and source of input data.	254	LAYERS

dBASE III PLUS FILE STRUCTURE FOR SPECIAL TYPES OF RECORDS

Structure for database: ABST.DBF
Indexed on CODE to ABSTCODE

Field	Field Name	Type	Width
1	CODE	Numeric	6
2	ABST1	Character	254
3	ABST2	Character	254

Structure for database: ABST2.DBF
Indexed on CODE to ABST2CODE

Field	Field Name	Type	Width
1	CODE	Numeric	6
2	ABST3	Character	254
3	ABST4	Character	254
4	ABST5	Character	254

Structure for database: ENV.DBF
Indexed on CODE to ENVCODE

Field	Field Name	Type	Width
1	CODE	Numeric	6
2	STATUTE	Character	45
3	PROJ_TYPE	Character	20
4	PROPOSER	Character	50
5	PER_DATE	Character	5
6	DRAFT_DATE	Character	5
7	FINAL_DATE	Character	5

Structure for database: FISH.DBF
Indexed on CODE to FISHCODE

Field	Field Name	Type	Width
1	CODE	Numeric	6
2	WATR	Character	254

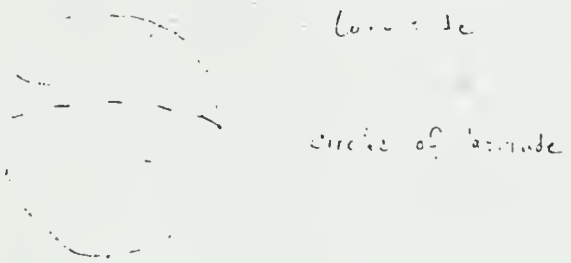
Structure for database: AUT.DBF
Indexed on CODE to AUTCODE

Field	Field Name	Type	Width
1	CODE	Numeric	6
2	ACRONYM	Character	20
3	PURPOSE	Character	55
4	STRUCTURE	Character	2
5	CONTACT	Character	75
6	STATUS	Character	1
7	AVAIL	Character	1
8	ONLINE	Logical	1
9	INTERACT	Logical	1
10	PC_ACCESS	Logical	1
11	END_USER	Logical	1
12	DATA_BASE	Logical	1
13	OUTPUT	Character	3
14	STORAGE	Character	3
15	MEGABYTES	Character	6
16	HARDWARE	Character	40
17	LOCATION	Character	55
18	OPER_SYST	Character	20
19	LANGUAGE	Character	35
20	DBMS	Character	20
21	DOCUM	Character	6
22	OTHERS	Character	35
23	IMP_YR	Character	2
24	LAST_MOD	Character	4
25	IN_FREQ	Character	1
26	OUT_FREQ	Character	1
27	SOURCES	Character	254
28	USERS	Character	45
29	WILL_SHARE	Logical	1
30	CONDITION	Character	60
31	TRANSFER	Character	60
32	SUPPORT	Character	40
33	MIN_MEM	Character	6
34	CAPACITY	Character	50
35	NO_USERS	Character	2
36	FED_REPOS	Character	25
37	COMMENTS	Character	254
ADDITIONAL FIELDS USED ONLY FOR DIGITAL DATA FILES			
38	SOFTWARE	Character	35
39	COORD	Character	30
40	SPATIAL	Character	4
41	AGGREG	Character	4
42	PERIPH	Character	75
43	OUT_PROD	Character	55
44	OVERLAY	Logical	1
45	LAYERS	Character	254

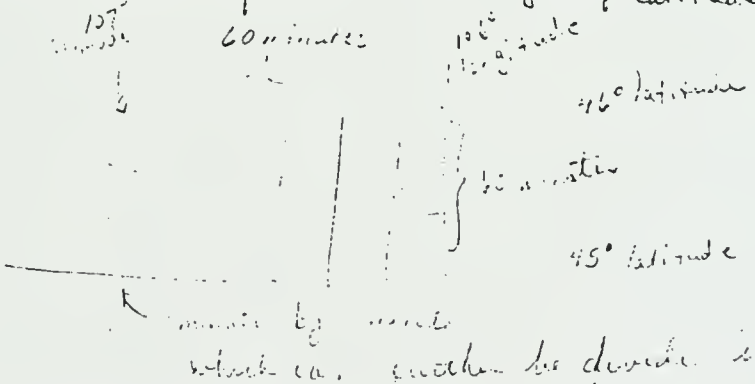
INTRODUCTION TO GEOGRAPHICS

Latitude and Longitude

To facilitate locating any spot on the earth, a geographic grid has been superimposed over the globe. The has line of longitude running from the north pole to the south pole. The circles of latitude are parallel to the equator.

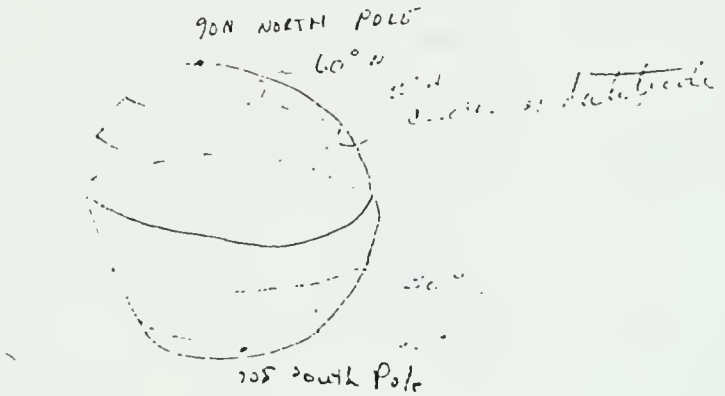


Latitude and longitude are measured in degrees, minutes, and seconds. Each degree can be divided into 60 minutes, each minute can be further divided into 60 seconds. We will only use degrees and minutes to locate areas in Montana. (One degree of longitude does not cover the same amount of area as one degree of latitude).



Longitude lines are numbered from east to west, starting with the "Greenwich" longitude line as 0 degrees. (This particular line runs through the town of Greenwich, England, home of the Royal Observatory). There are 360 degrees of longitude around the equator (the same as the number of degrees in a circle).

Latitude "circles" sun parallel to the equator. The equator is labeled as 0 latitude. North of the equator the latitude circles run from 0 , at the equator to 90 N, at the north pole. South of the equator the latitude circles run from 0 , at the equator, to 90 S, at the south pole. For purposes of locating areas in Montana, drop the 'N', it is not necessary, since all areas in Montana are north of the equator. Latitude is measured from south to north.



To determine the latitude and longitude of an area, first draw the area on a copy of the Montana map, an example is shown in figure 26. Next draw a box around the area. When the study covers several areas which are not connected, include all the areas in a single box.

Longitude is read from right to left. Therefore to find the east longitude, find the largest line of longitude just to the right of the study area. In the example this is 110 . Put the template with the 0 minute side or 110 (see example), and going from right to left try to get within 5 minutes of the right-most part of the study area. The area in the example is about 25 minutes (25'), write this down. The east longitude is 11025.

To find the west longitude, a similar method can be used. Find the largest line of longitude <u>within</u> the study area, in the example it is 111 . Then use the template to find the minute measurement of the far left edge, here 55'. The west longitude is 11155. <u>Do not</u> read the template from left to right, a common error.

Latitude is read from south to north (bottom to top). To find the south latitude of the study area, find the largest line of latitude below the study area. In the example it is 46 . Using the template measure up from this line to the most southern point of the study area, here 05', the south latitude is 4605.

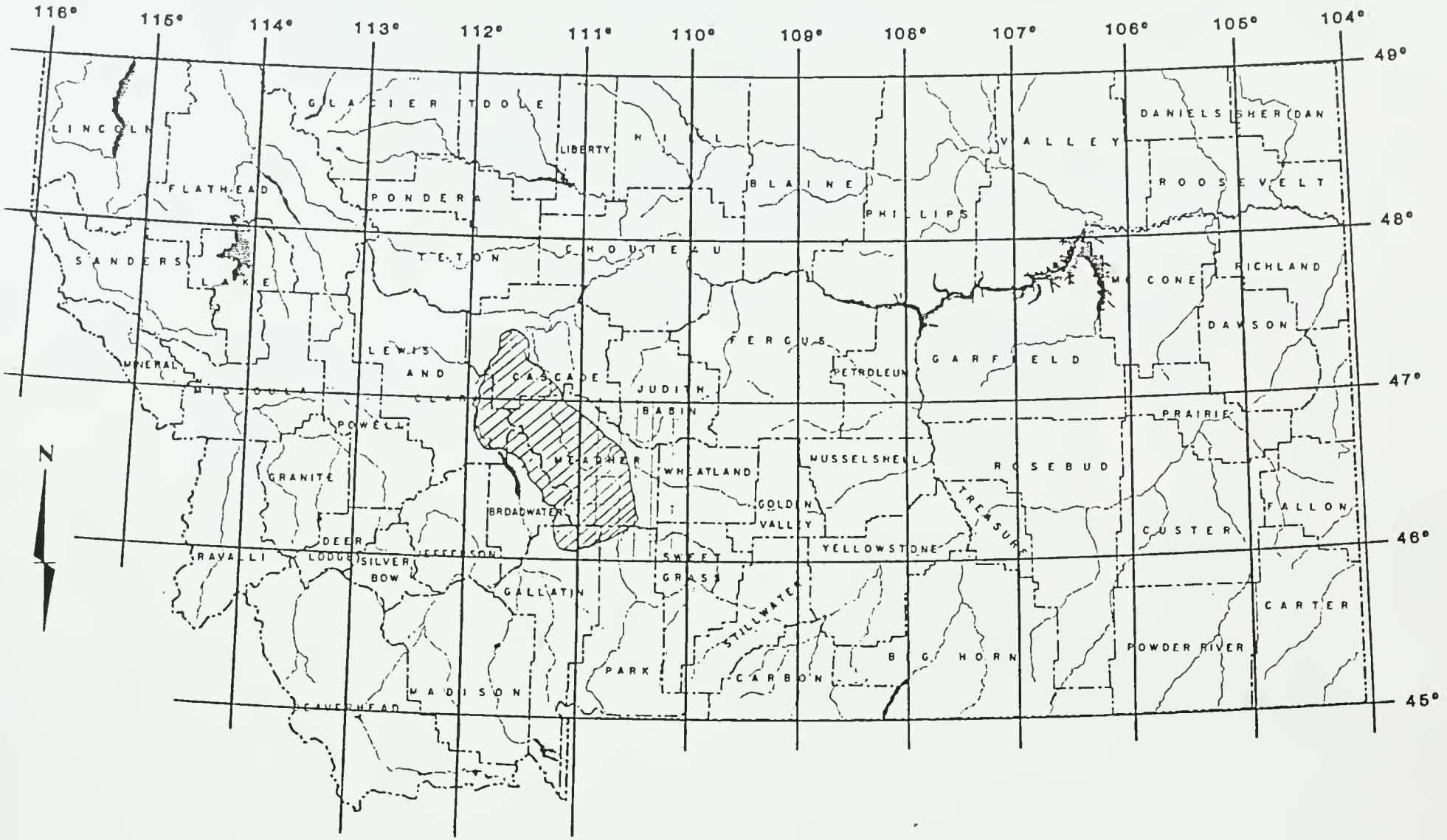

116°
115°
114°
113°
112°
111°
110°
109°
108°
107°
106°
105°
104°
49°
48°
47°
46°
45°
N
LINCOLN
FLATHEAD
GLACIER
TOOLE
LIBERTY
HILL
BLAINE
VALLEY
DANIELS
SHERIDAN
ROOSEVELT
PONDERA
PHILLIPS
SANDERS
LAKE
TETON
CHOUTEAU
MCCONE
RICHLAND
DAWSON
FERGUS
GARFIELD
MINERAL
MISSOULA
LEWIS AND CLARK
CASCADE
JUDITH BASIN
PETROLEUM
POWELL
PRAIRIE
GRANITE
WEAVER
WHEATLAND
MUSSELSHELL
ROSEBUD
BROADWATER
GOLDEN VALLEY
TREASURE
FALLON
DEER LODGE
JEFFERSON
YELLOWSTONE
CUSTER
RAVALLI
SILVER BOW
SWEET GRASS
GALLATIN
STILLWATER
CARTER
PARK
CARBON
B. H.
POWDER RIVER
MADISON
BEAVERHEAD

Figure 26

The north latitude is found by finding the largest line of latitude within the study area, in the example 47 . Then using the template read up to the northernmost point of the study area, estimate the reading of that point to the nearest 5 degrees, here 25', the north latitude is 4725.

The accuracy of the latitude/longitude measurements will depend on how carefully the study area was transferred to the map and how well the estimation is done.

Township and Range

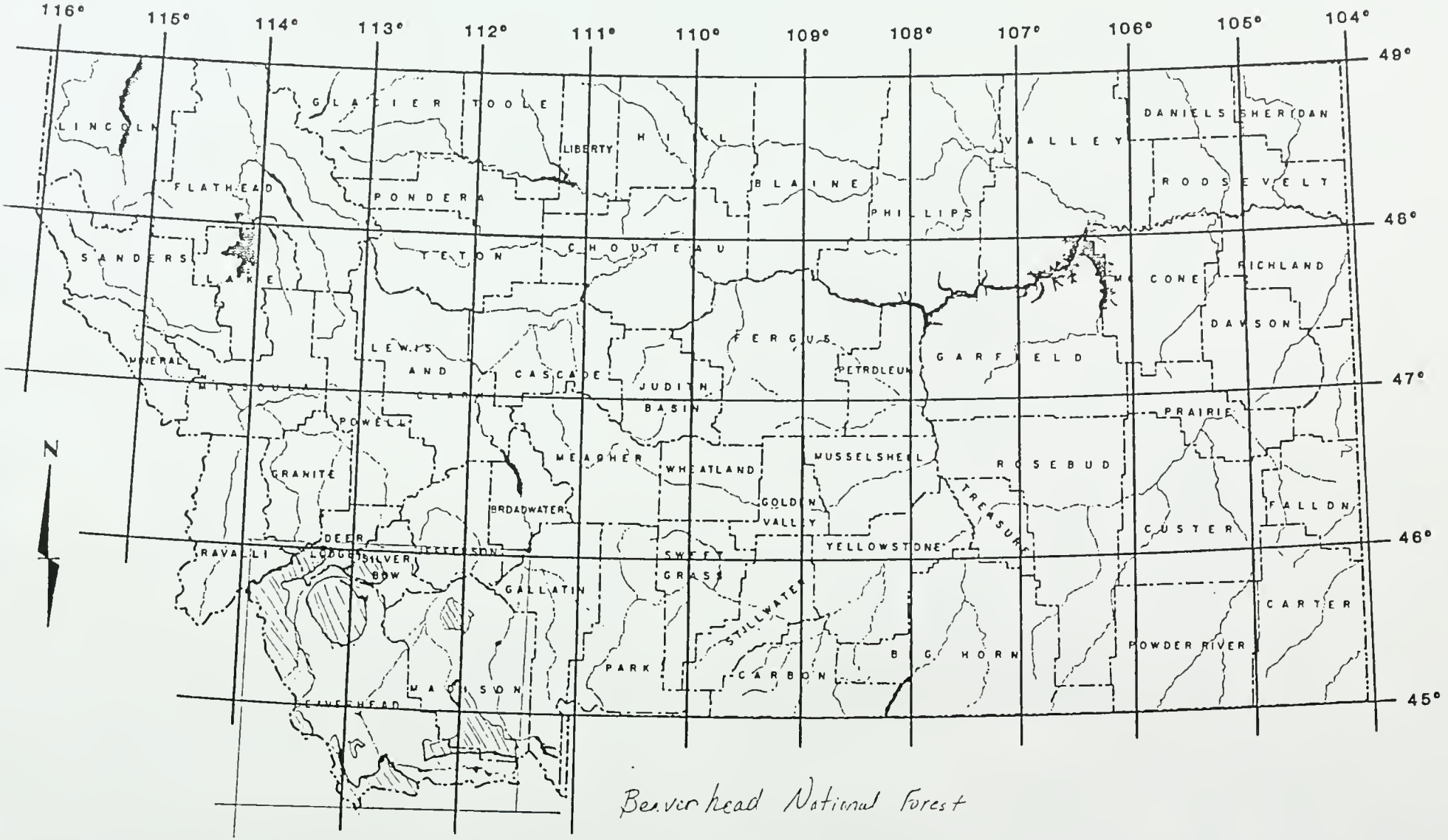
Another common method of locating a particular area is by township and range. Unlike latitude and longitude which cover the entire globe, township and range are state dependant.

Each state is divided up into townships, ranges, and sections. If you know the township and range, it is easy to determine the lat/long. Township and range information is often given on maps or in site-specific descriptions in documents.

Townships are 36 square miles (6x6 miles). These are shown as boxes on USGS maps. Townships are further broken down into section which are 1 square mile each. Each section is assigned a number, however it is not necessary to get down to this level of site specific detail for NRIS indexing.

The numbers for townships and ranges start at the Principal Meridian. In Montana, the Principal Meridian is located near Three Forks, very close to Willow Creek.

Work east-west for township, and south-north for range.



Beaverhead National Forest

of least rectangle to enclose of disjoint areas.

COUNTIES Deerlodge, Beaverhead, Madison, Silver Bow

DFWP Districts .

Basins # 10020001, 10020004, 10020003, 10020007, 17010201

Latitude - N 4602

S 4423